انستیتو آموزشی تحقیقاتی و درمانی
قلب و عروق شهید رجایی

Occupational Therapy's Role in Cardiac Rehabilitation of Patients with Cardiovascular Diseases

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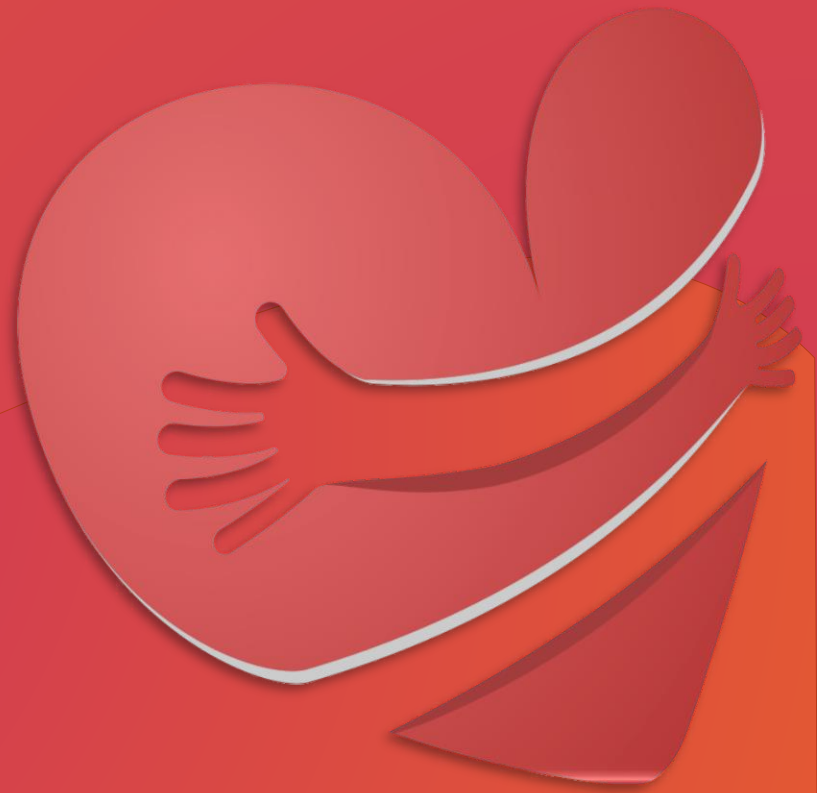
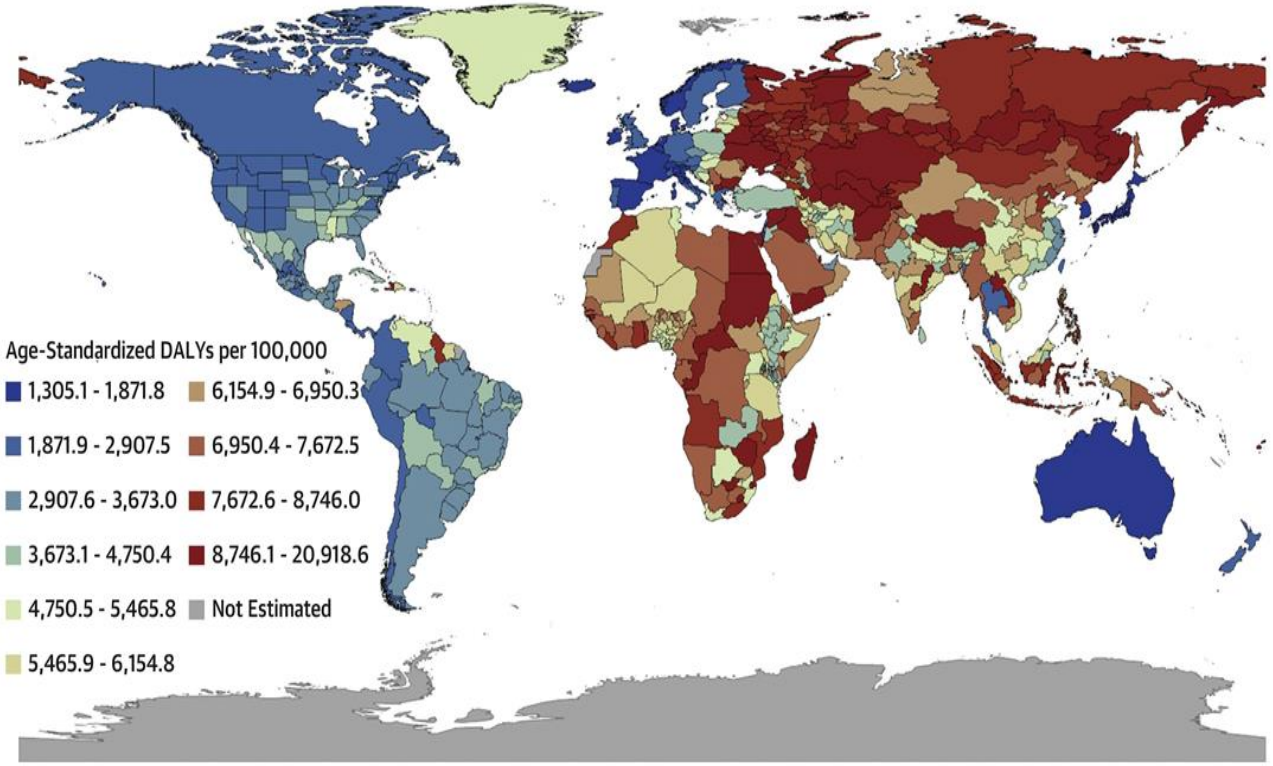


February, 2024

Global Burden of Cardiovascular Diseases

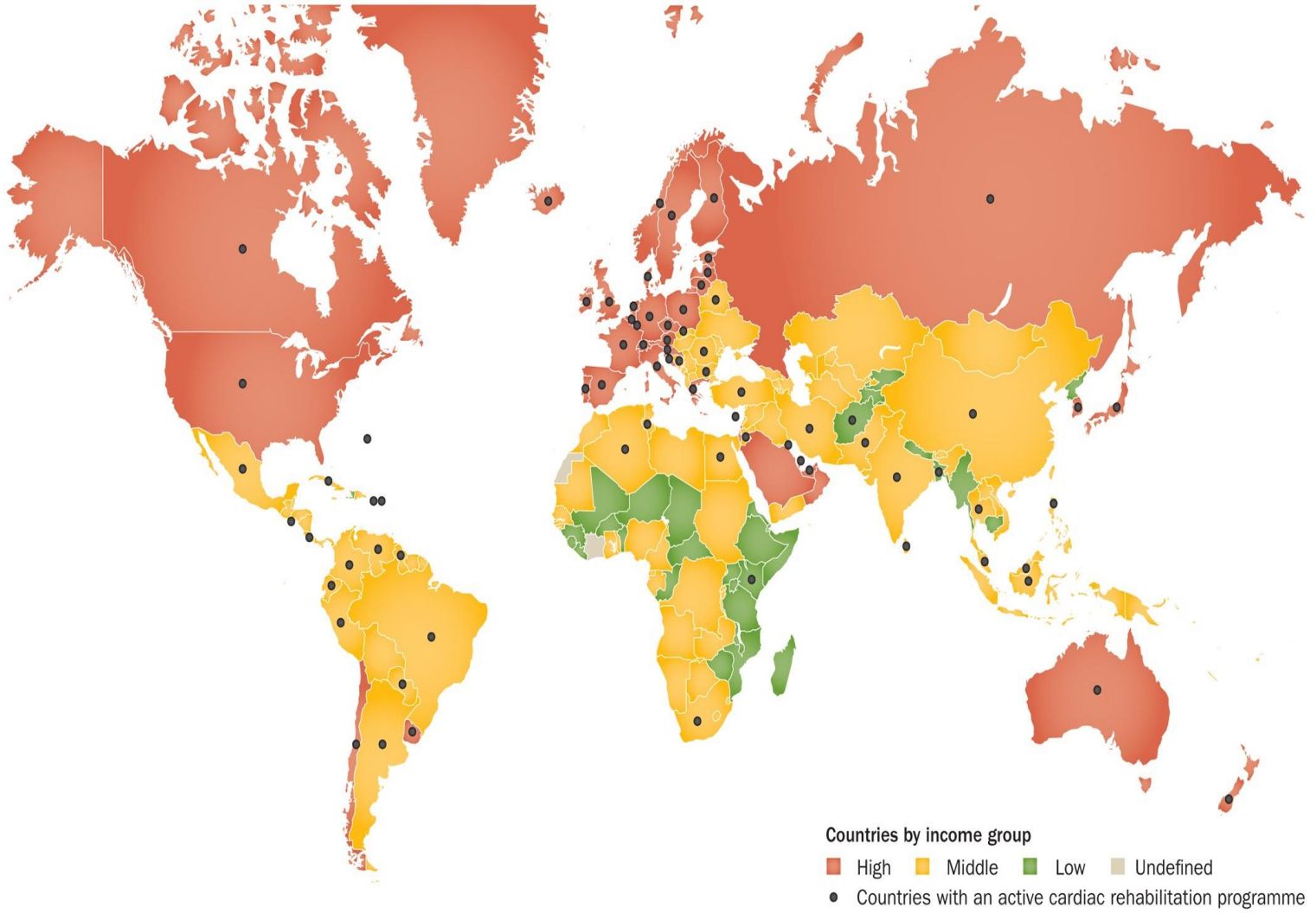
Cardiovascular problems are a global health concern, affecting millions of individuals and their quality of life.



The Global Burden of Cardiovascular Diseases and Risk. J Am Coll Cardiol. 2022 Dec, 80 (25) 2361–2371.

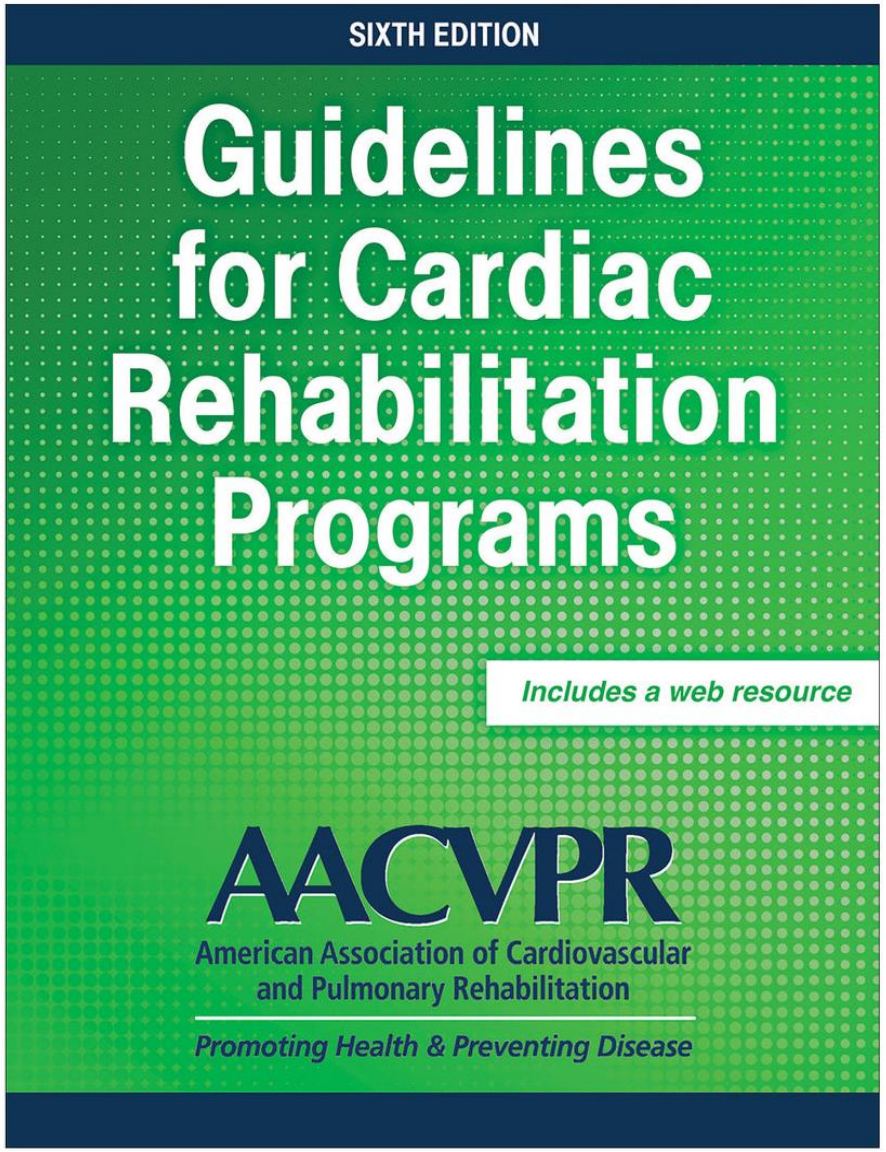
Global availability of Cardiac Rehabilitation

Cardiac rehabilitation services are poorly implemented worldwide, with only 38.8% of countries having CR Centers



Global availability of cardiac rehabilitation. Nat Rev Cardiol 11, 586–596 (2022).

Cardiac rehabilitation (CR) is a guideline-recommended, multidisciplinary program of exercise training, risk factor management, and psychosocial counseling for people with cardiovascular disease (CVD)



Value of Cardiac Rehab

Interventions	NNT	Lives saved per 1000 patients
Anti-platelets	153	
ACE inhibitors	108	
Statins	94	
Beta blockers	42	
Cardiac rehab	37	

Sources: Created by Kaiser Permanente using the following sources. For anti-platelets, statins, beta blockers: HT Ong, "Beta Blockers in hypertension and cardiovascular disease", BMJ 2007. For ACE inhibitors: HT Ong, "Angiotensin-Converting Enzyme Inhibitors (ACEIs)...: A Meta-Analysis of 10 Randomised Placebo-Controlled Trials", ISRN Cardiology, 2013.

Recommendations for Nonpharmacological Interventions

2022 AHA/ACC/HFSA Guideline for the Management of Cardiovascular Diseases: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Nonpharmacological Interventions For CVD

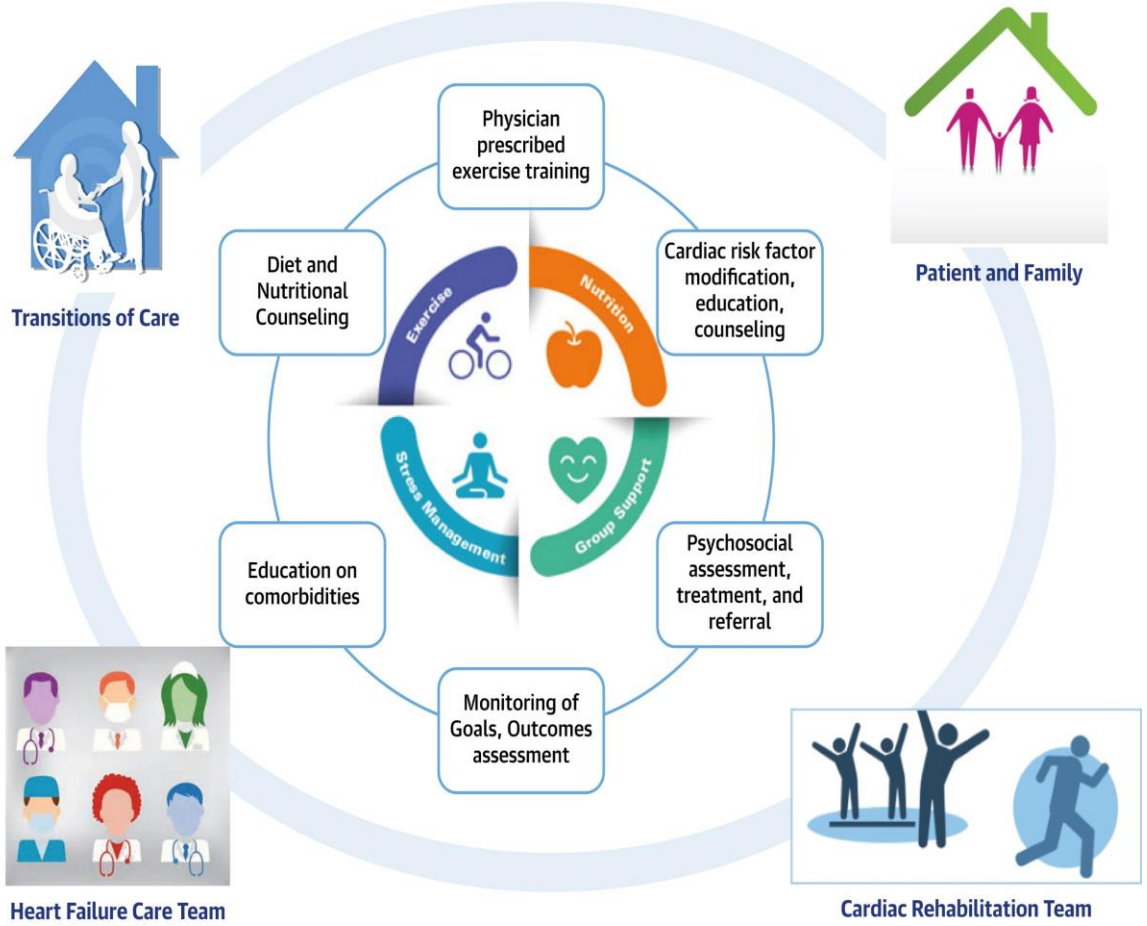
- Self-Care Support
- Dietary Sodium Restriction
- Exercise Prescription
- Cardiac Rehabilitation
- Activity

Goals of Cardiac Rehabilitation

- Promote secondary prevention
- Limit the psychological and physiological stresses associated with cardiovascular disease
- Reduce the risk of associated mortality
- Improve cardiovascular function to help patients optimize their quality of life

Common Components of Cardiac Rehabilitation and Collaborative Teams

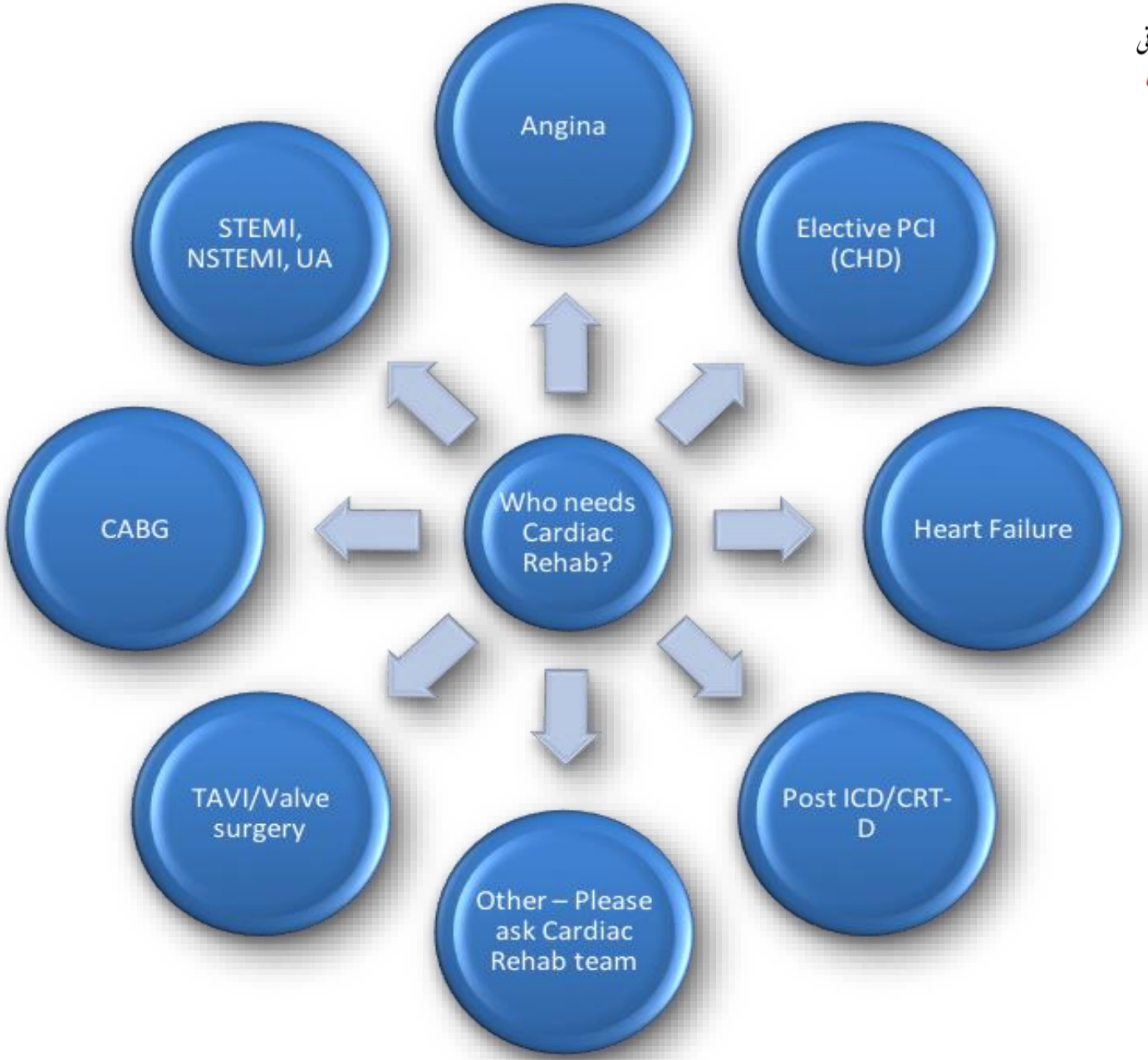
- Common components of cardiac rehabilitation are represented in the **central circle**.
- There should be close collaboration and communication among the cardiac rehabilitation team, heart failure care team, consultants, patient and family members, and other team members involved in transitions of care
- especially post-discharge following hospitalizations and acute to nonacute or long-term care facilities, which is represented in the **outer circle.**



- Cardiologist/Physician
- Clinical Nurse Specialist
- Physiotherapist
- Clinical nutritionist/Dietitian
- **Occupational Therapist**
- Pharmacist
- Psychologist
- Smoking cessation counselor/nurse
- Social worker
- Vocational counselor
- Clerical Administration

Cardiac rehabilitation for patients with heart failure: JACC expert panel. Journal of the American College of Cardiology, 2021. ***77****(11): p. 1454-1469.*

Who needs CR?


Angina
Elective PCI (CHD)
Heart Failure
Post ICD/CRT-D
Other – Please ask Cardiac Rehab team
TAVI/Valve surgery
CABG
STEMI, NSTEMI, UA
Who needs Cardiac Rehab?

Evaluation

FITT

Frequency, Intensity, Time, and Type of CR Regimen

- Demographics
- NYHA function class
  Pain
- CPET
  Vo2 peak
- Anthropometric
- Echocardiography
  LVEF%
  GLS%
- Imaging
- Heart Rate
- SNAQ
  MNA
- 6MWT
  4MGS
- NT-ProBNP
- Handgrip Strength
- IHF-QOL

Cardiac Risk Stratification In Cardiac Rehabilitation Programs

Low risk (all listed findings must apply)

MET: Metabolic Equivalent Of Task

$$1\,\text{MET} \equiv 1\frac{\text{kcal}}{\text{kg} * h} \equiv 4.184\frac{\text{kJ}}{\text{kg} * h}$$

EF: ejection fraction

❑ Findings/Results of the graded exercise testing:

• No complex ventricular arrhythmias under increasing exercise and in the recovery phase.

• No angina or other significant symptoms (e.g., unusual shortness of breath, light-headedness, or dizziness) under increasing exercise or recovery or in the recovery phase

• Normal hemodynamics under increasing exercise and in the recovery phase (e.g., adequate heart rate increase and recovery, adequate increase in systolic blood pressure under increasing exercise, and decrease in the recovery phase).

• Exercise capacity ≥ 7 METs (≥1.8 watts/kg body weight).

➢ Other findings:

• No significant left ventricular dysfunction (EF ≥ 50%).

• uncomplicated course after myocardial infarction, bypass surgery or after elective coronary revascularization

• No complicated ventricular arrhythmias at rest

• No signs of heart failure

• No signs of residual ischemia

• No clinically relevant depression

Cardiac Risk Stratification In Cardiac Rehabilitation Programs

Moderate risk (if diagnosed with one or more of the listed findings)

❑ **Findings/Results of the graded exercise testing:**

• Onset of angina or other significant symptoms (e.g., unusual shortness of breath, light-headedness, or dizziness at higher exercise intensities (<7 METs (<1.4 watts/kg body weight)) during exercise testing

• Onset of mild or moderate silent ischemia during exercise testing or in the recovery phase (ST-segment depression < 2 mm from baseline)

• Exercise capacity <5 METs (<1.2 watts/kg body weight)

➢ **Other findings:**

• Moderately impaired left ventricular function (EF 40–49%).

Cardiac Risk Stratification In Cardiac Rehabilitation Programs

High risk (if diagnosed with one or more of the listed findings)

❑ Findings/Results of the graded exercise testing:

• Complex ventricular arrhythmias during exercise testing or in the recovery phase.

• Angina or other significant symptoms (e.g., unusual shortness of breath, light-headedness, or dizziness) at low exercise intensity (≤5 METs; 1.2 watts/kg body weight) during exercise testing and during the recovery phase

• Myocardial ischemia during exercise or in the recovery phase (ST-segment depression ≥ 2 mm)

• Pathological hemodynamics during exercise (e.g., chronotropic incompetence, flattening/decrease in systolic blood pressure during exercise) or in the recovery phase (e.g., severe post-exercise hypotension).

➢ Other findings:

• reduced left ventricular function (EF < 40%)

• condition after cardiac arrest or resuscitation

• complex arrhythmias at rest or during exercise

• myocardial infarction, cardiac surgery, or interventional coronary revascularization with consecutive shock or residual ischemia

• pulmonary hypertension

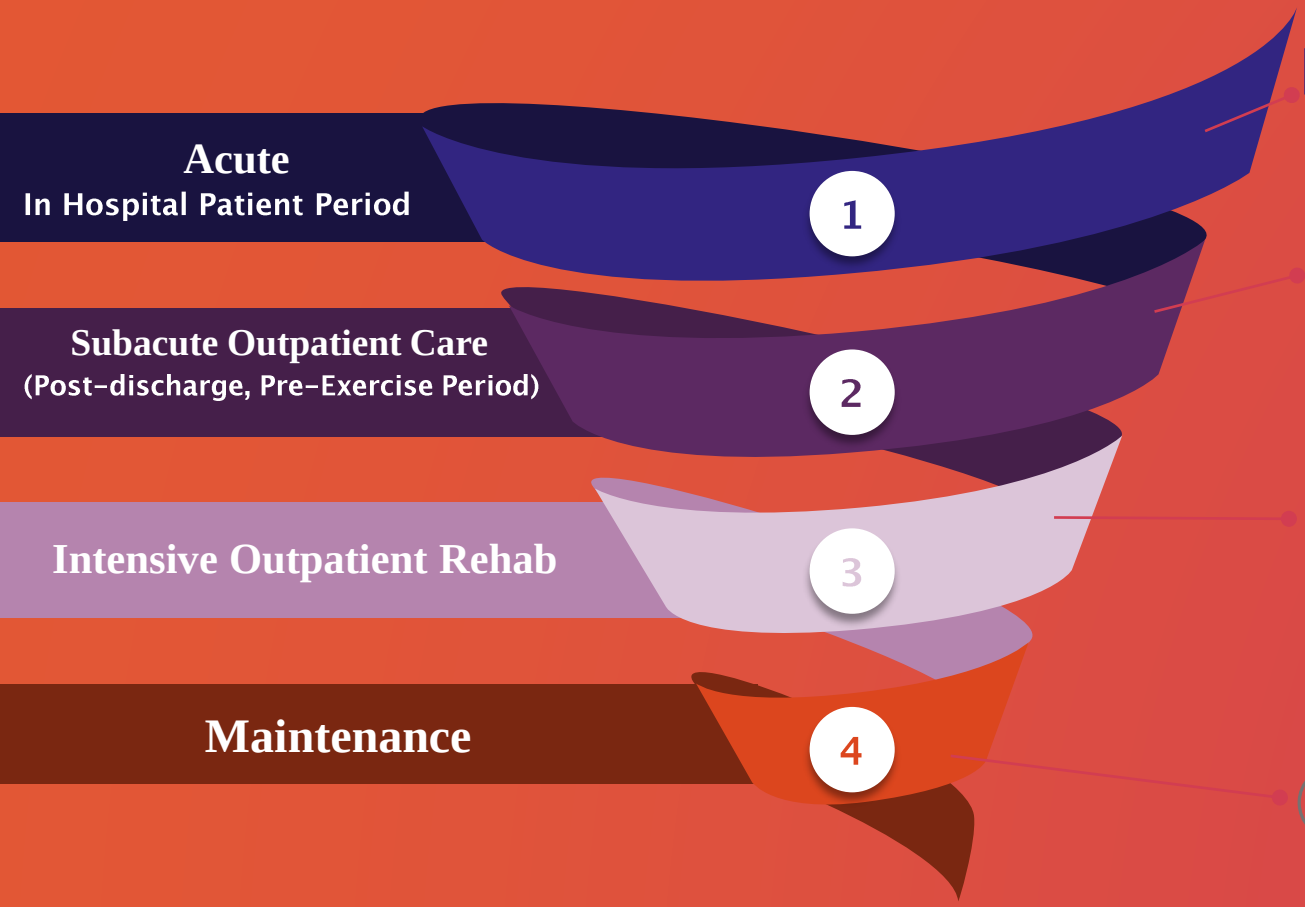
• condition after (ICD, CRT, VAD) implantation

• condition after heart transplantation (clinically stable)

• clinically relevant depression

• congenital heart disease and valvular heart disease require special individual cardiac assessment and consideration

Cardiac Rehabilitation program progress through the four main phases:



- Patients with acute heart conditions, such as those recovering from heart surgery or a heart attack, may be referred to a cardiac rehab team while still in hospital.
- This phase will likely last between 2 and 5 days, depending on Patients physical condition.

- Phase 2 takes place after Patients leave the hospital.
- This phase will last between 3 and 6 weeks.
- Phase 2 is very closely supervised and is aimed at patients who are still very severely affected by their heart condition.

- If patient experience a severe cardiac event or surgery, need to complete phases 1 and 2 before Phase 3
- Some patients with less intense cardiac conditions may enter Phase 3 directly.
- Phase 3 introduces more independent exercises and self-monitoring.
- A full Phase 3 CR program will comprise 36 outpatient sessions
- some patients may need inpatient care and others may need fewer sessions and/or less supervision.
- This stage is often covered by health insurance.

- If Patient has completed the previous 3 stages of CR, should have a clear grasp of heart condition and how best to manage it.
- Phase 4 essentially continues for the rest of Patient's life.

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What's the Role of Occupational Therapy in Cardiac Rehabilitation?

Role of OT in CR
(Phase 1)

1. Assessment

Monitoring of vitals with activity

2. Education

Client and caregiver education

Restoring function

3. Movement

Emphasis on early mobilization

4. Discharge Plan

performing evaluations to assist with the coordination of care and to determine appropriate discharge recommendations

Role of OT in CR
(Phase 2)

1. **Reinforce learning from Phase 1**

2. **Move toward independent self-care**

   Evaluations ADL, IADL re-training

   Energy-conservation strategies

   Cognitive impairments

- The main goal is to increase their levels of independence and enable patients to move into Phase 3.

Role of OT in CR
(Phase 3)

1. Evaluation

Range of motion

Muscle strength resting

Endurance levels

ADL

2. Exercise

- **During Cardiac Rehab, exercise program will be closely supervised by medical professionals to ensure your safety.**
- **level of exercise will depend on how fit patients were before their cardiac condition, current stamina and ability, symptoms, and a number of other health factors.**

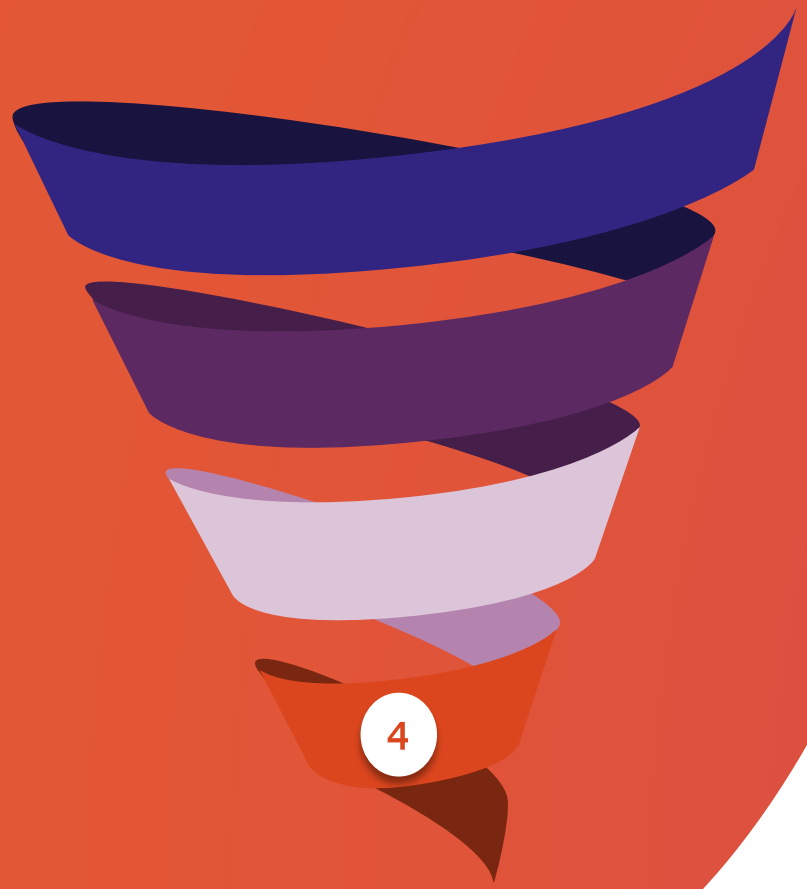
3. Education

Maximize quality of life

Manage symptoms

Lifestyle

Role of OT in CR
(Phase 4)



1. Follow Up

ADL

Maximize quality of life

Manage symptoms

Lifestyle

2.Education

maximize functional independence within the context of their own homes

In conclusion, Occupational Therapy plays a vital role in the cardiac rehabilitation of patients with cardiovascular diseases.

- By addressing the physical, emotional, and psychosocial aspects of recovery, Occupational Therapists contribute significantly to the overall well-being and quality of life of these patients.

- Through their expertise in activity analysis, therapeutic exercise, and adaptive techniques, Occupational Therapists help patients regain functional independence, improve cardiovascular health, and enhance their ability to perform daily activities. They design tailored rehabilitation programs that focus on increasing endurance, strength, and flexibility while considering the unique needs and limitations of each patient.

- Occupational Therapists also play a crucial role in educating patients about lifestyle modifications, risk factor management, and self-care strategies. By empowering patients with knowledge and skills, Occupational Therapists facilitate long-term behavior change and encourage them to take an active role in their own recovery and cardiovascular health.

- Furthermore, Occupational Therapy interventions extend beyond physical rehabilitation. Occupational Therapists address the emotional and psychosocial aspects of recovery by providing counseling, stress management techniques, and strategies to cope with anxiety and depression. They emphasize the importance of maintaining social connections, engaging in meaningful activities, and developing coping mechanisms to navigate the challenges associated with cardiovascular diseases.

- Collaboration and interdisciplinary teamwork are essential in the cardiac rehabilitation process, and Occupational Therapists work closely with other healthcare professionals, including physicians, nurses, physiotherapists, and dietitians. By contributing their unique perspective and expertise, Occupational Therapists enhance the effectiveness and comprehensiveness of the rehabilitation program, leading to better outcomes for patients.

- In summary, Occupational Therapy's role in cardiac rehabilitation goes beyond the physical realm, encompassing the holistic well-being of patients with cardiovascular diseases. Through their specialized knowledge and interventions, Occupational Therapists empower patients, promote functional independence, and facilitate optimal recovery. By recognizing the significance of Occupational Therapy in cardiac rehabilitation, healthcare systems can ensure comprehensive care and improved quality of life for individuals with Cardio Vascular Diseases.

Frequency, Intensity, Time, and Type of Exercise Regimen for Patients with CVD in Cardiac Rehabilitation

FITT	Aerobic Exercise					Resistance Exercise
	Week	Moderate continuous training*		Interval training/ high intensity†		
		Clinic	home	Clinic	home	Clinic/ home
Frequency (days/week)	1–2	3		3	3 MCT	2 or 3 nonconsecutive
	3–6	3	2	3	2 MCT	2 or 3 nonconsecutive
	7–12	3	2	3	2 MCT	3 or 4 nonconsecutive
	13 to…	2	3	2	3 MCT	3 or 5 consecutives
Intensity	1–2	60% HR_{peak}	≤ 14 on Borg scale ≤ 60% HR_{peak} Resting HR+30 bpm	30- 60s up to 2-min (80- 90% of HR_{peak}), separated by 3-min active recovery periods of moderate intensity (60-70% of HR_{peak})		Determined by the amount of weight lifted and the repetitions and sets Goal of 8–10 exercises, about 1–3 sets of 8–16 repetitions of each exercise
	3–6	70% HR_{peak}				
	7–12	70% HR_{peak}				
	13 to…	60-70%HR_{peak}				
Time (min/day)	1–2	15–30	Gradually increase duration until 30–60	2 sets		Depends on strength and schedule: up to 1h for total body workout, less for split-routine workout
	3–6	30–35		3 sets		
	7–12	30–35		4 sets		
	13 to…	40		4-5 sets		
Type	1–2	Active Walking	Any activity that increases HR, such as running, walking, cycling, or dancing	Active Walking		Activities using resistance: bands, dumbbells, machines, body weight exercise
	3–6	Walk Treadmill Bicycle		Walk Treadmill Bicycle		
	7–12					
	13 to…					

Every Sessions are including: Warm up: 5 min and cool down: 5 min, at (50-60% of peak heart rate)

Some patients may be unable to exercise up to the prescribed heart rate, such as those taking β-blockers. In these patients, a rating of perceived exertion between 12 and 14 may be used to guide exercise intensity

For patients who exhibit exercise-induced ischemia or angina, exercise intensity can be set at a heart rate of 10 beats/min less than the heart rate at which the onset of angina or ischemia occurs

Patients with HFrEF, are particularly likely to have Sarcopenia and skeletal muscle changes
Resistance training may be a suitable strategy in such patients, as it increases muscle and bone mass

Inspiratory muscle weakness is widespread among patients with HF, addition the inspiratory muscle training to aerobic training can be reduce dyspnea, increase peak Vo 2 and exercise time, and improve QOL

⁎ Moderate intensity: 50% to 69% of target heart rate , † High intensity: 70% to <90% of target heart rate.

“A Strong Heart is a foundation for a fulfilling Life”

Thank You